

VIII. *A Letter from John Phil. Breyne, M. D. F. R. S. to Sir Hans Sloane, Bart. Pres. R. S. with Observations, and a Description of some Mammoth's Bones dug up in Siberia, proving them to have belonged to Elephants.*

S I R,

YOUR very learned and instructive Accounts of *Elephants* Teeth and Bones found under Ground, I saw with great Pleasure in the *Philosophical Transactions*, N^o 403. and 404. In the same Year, to wit 1728. I was busied about the very same Matter, especially to prove, that the extraordinary large Teeth and Bones found under Ground, and digged up in several Places of *Siberia*, by the Name of *Mammoth's*, or *Mammut's*, Teeth and Bones, were,

I. True Bones and Teeth of some large Animals once living ; and,

II. That those Animals were *Elephants*, by the Analogy of the Teeth and Bones, with the known ones of *Elephants*.

III. That they were brought and left there by the universal Deluge. I made likewise several useful Inferences about this Matter.

At the same time there flourished in our City a Society of some learned and ingenious Gentlemen, who met once a Week in a certain Place : In one of those Meetings in the Month of *March*, I had the Honour
to

to read and communicate my Thoughts and Observations about this Subject; which, as I believe, they will not be disagreeable to you, I have translated into the *English* Tongue, and joined to this present Letter.

After that, *viz.* in the Year 1730, Dr. *Messerschmidt* returned to *Dantzick*, from his Travels thro' *Siberia*, and was pleased to communicate to me some curious Draughts of a Part of a Skeleton, to wit, of a very large Skull, *Dens exsertus & molaris*, with the *Os femoris*, belonging to the Animal commonly called *Mammoth*, found in *Siberia*; by which our Assertion, that the Teeth and Bones, called in *Russland* *Mammoth's* Bones, are the true Teeth and Bones of *Elephants*, is not only, as you wished in your first Account, put in a greater Light, but, if I am not mistaken, demonstrated beyond all Doubt.

Therefore I cannot forbear sending you these Draughts copied, for your Inspection, with the Explications and the Testimony added. Being with true Respect,

S I R,

Dantzick,
Sept. 28, 1735.

Your most humble and most
obliged Servant,

J. P. Breyne.

*Observations on the Mammoth's Bones
and Teeth found in Siberia: Read in a
Meeting of some learned Gentlemen at
Dantzick in the Year 1728. by J. P. B.*

THAT learned and curious Gentleman Dr. *Daniel Gottlieb Messerschmidt*, who was sent some Years ago, by his late *Czarish* Majesty, *Peter the Great*,

Great, into *Siberia*, to search after the Products of Nature in this uninhabited and cold Country; was pleased to send me in the Year 1722, amongst some other Samples of Natural Things out of *Siberia*, two very large Teeth, called there, *Mammoth* or *Mammut's* Teeth, with the following Inscription: *Dens molaris, ut videtur, diluvianus, Belluæ cujusdam hætenus incognitæ, nisi pro Elephantino habendus sit, cujus jam penes Te esto arbitrium, Russis Mammoth, repertus in Montium altissimis jugis ad Thomam fluvium. Alterum est frustum aliud Eboris Denti exerto Elephantis non absimile, ab aliis repertum in Thomæ Montibus.*

After I had made an accurate and nice Examination of them, I thought it worth my Pains, Gentlemen, to shew you the same here.

One is a *Dens Molaris*, or Grinder, a Foot broad, half a Foot long, and three Inches thick, weighing 8 lb and 3iij. pretty entire, except that it is broken in two Pieces, and the Extremities of the Roots spoiled. The Substance is between that of a Bone and Stone, except that on the upper part of the Outside some parallel undulated Lines appear, which have still preserved the Enamel of the Tooth.

The other is a Piece of a *Dens exertus*, 8 Inches long and 3 Inches thick, of 1 Pound and 6 Ounces Weight; in some Places not different from Ivory, but in others calcined like the common *Unicornu Fosse*.

What

What *Tsbrand Ides* ‡ mentioneth of the *Mammoth's* Teeth and Bones, deserves to be looked at ; as also the Journal of *Laurens Lange's* Journey to *China* *, and the Remarks of Capt. *John Bernard Muller* †.

Those above-mentioned, as far as I know, are the chiefest Authors which have treated of the *Mammoth's* Teeth and Bones, as a very remarkable and particular Curiosity of *Siberia*.

It would not be worth while, nor our Pains, to detain you with the Refutation of some partly merely fabulous Opinions, quoted by the said Authors, about the Origin of those Teeth and Bones : Therefore I design only to pick out of the Testimonies of Matters of Fact of the foresaid Authors, the following Points to my Purpose :

1. That those Teeth and Bones are found in *Siberia*, chiefly in the Northern Parts, near the Rivers *Fenizea, Trugau, Mongam-Sea, Lena, &c.* towards the icy Sea ; at the Time when the Ice has broken the Banks of those Rivers, so that part of the adjacent Mountains do fall down ; and that they are found in such Quantity as is sufficient for Trade, and to make a Monopoly for the *Czar* ||.

2. That sometimes Skeletons of this kind are found very near complete.

3. That those Teeth and Bones are not found always of the same Size, but sometimes very large ; as

‡ In his Travels from *Mosco* to *China*. * † To be found in the
Present State of *Russia*. || *Vid. The Present State* of *Russland*.

Dentes molares, or Grinders, of 20 or 24 Pound weight †, and *Dentes exerti*, two of which weighed 400 Pound ‡; sometimes of a middle Size, as mine above-mentioned, and at other times still smaller.

4. That of those Teeth, *viz.* *Dentes exerti*, some are used as Ivory, to make Combs, Boxes, and such other Things. Capt. *Muller* saith **, that it in every thing resembles the common Ivory, being but a little more brittle, and easily turning Yellow by Weather or Heat.

Out of these quoted Remarks join'd to ocular Inspection, I think I may advance three Things.

I. That those *Mammoth's* Teeth and Bones are truly natural Teeth and Bones, belonging heretofore to very large living Animals; because they have not only the external Figures and Proportions, but also the internal Structure analogous to natural Teeth and Bones of Animals.

II. That those large Animals have been *Elephants*; which appears by the Figure, Structure and Bigness of the Teeth, which do accurately agree with the Grinders and Tusks of *Elephants*.

To be convinced hereof, one needs but to compare these Teeth with the Figures of those which some Years ago were digged up in *Ireland*, and those which represent the very natural Teeth of *Elephants*, and consider the accurate Remarks made by Dr. *Molineux* and other curious Fellows of the *Royal Society* thereon.

† Capt. *Muller loc. cit.* ‡ *Isbrand Ides loc. cit.*
Isbrand Ides and Capt. *Muller loc. cit.*

** Vid. *Is-*

Nor needs any body to doubt, that they are true Teeth of *Elephants*; from the uncommon Size of the *Mammoth's* Teeth before-mention'd; because *Verto-mannus*, as the famous Mr. *John Ray* tells us, has seen in *Sumatra* a Pair of *Elephant's* Tusks of 336 Pound Weight; and *Terzagus*, in *Museo Septaliano*, makes Mention of one two Yards long, and 160 Pound Weight.

III. That those Teeth and Bones of *Elephants* were brought thither by no other Means but those of a Deluge, by Waves and Winds, and left behind after the Waters return'd into their Reservoirs, and were buried in the Earth, even near to the Tops of high Mountains. And because we know nothing of any particular extraordinary Deluge in those Countries, but of the universal Deluge of *Noah*, which we find described by *Moses*; I think it more than probable, that we ought to refer this strange *Phænomenon* to the said Deluge. In such Manner, not only the holy Scripture may serve to prove natural History; but the Truth of the Scripture, which says that *Noah's* Flood was universal, a thing which is doubted by many, may be proved again by natural History.

Here I must take Notice, that such Teeth and Bones also are to be found in several other Countries besides *Siberia*, as *Poland*, *Germany*, *Italy*, *England*, *Ireland*, and many others; but less common than in *Siberia*, and not so well preserved, but more wasted and calcined, without doubt by the greater Warmth of those Climates.

Hither are also to be referr'd the large Bones found under Ground, or rather Tusks of *Elephants*, known by the Names of *Ebur*, seu *Unicornu fossile*, which are

of the same Origin with the *Mammoth's* Teeth, but different, as they are better preserved, and therefore, for a great part, have still the natural bony Substance, and may serve the Workmen as natural Ivory, and in some Measure the Physicians and Apothecaries as *Ebur, seu Unicornu fossile*.

An Explanation of the Draughts of the above-mention'd Antediluvian Bones of an Animal commonly called, The Mammoth of Siberia; or of the Bones of the fossile Skeleton of an Elephant; done to the antient Roman Scale contracted, and exhibited in six Figures. Translated from the Latin by T. S. M. D. F. R. S.

N. B. *All the FIGURES are reversed by the Mistake of the Engraver.*

FIGURE I. exhibits,

A Front View of the Head. It weighs 130 lb 3iij. 3v. 3j. Apothecaries Weight, or 152 Russian Pounds.

Its Length or greatest Height is 48 Inches.

Its greatest Breadth near the Ears, 29 Inches, 5 Lines.

Its Thickness from the Forehead to the Nape of the Neck, 22 Inches, 5 Lines.

aa. The *Os frontis*.

bb. The *Sutura sagittalis*, hardly to be discern'd.

c. The bony *Septum Nasi*, or the external Process of the *Os ethmoides*, without its Fellow.

dd. The Coronal Suture appearing imperfect.

ee. The *Ossa Sincipitis*.

ff. The

- ff.* The *Sutura squamosa* of the Temples.
gg. The *Sutura lambdoidea* of the Occiput.
h. The external *Processus zygomaticus* of the *Os temporum*.
i. The posterior lateral, or zygomatic Process of the *Os male* (or Cheek-bone).
k. The upper Process of the *Os male*, join'd with the outer Process of the *Os frontis*, and constituting a Part of the Orbit of the Eye.
l. The outer Process of the *Os frontis*, forming the upper Part of the Orbit.
m. The anterior Process of the *Os male*, join'd with the *Os maxillare*.
nn. The anterior Process of the *Os maxillare*, forming the Sockets of the foremost Teeth.
oo. The lower lateral Process of the *Os maxillare*, constituting the Sockets of the Grinders.
p. A Grinder in its Socket, one on each Side.
q. A surprizing Cavity of the Nose, stretching above the Palate, through which, by means of its *Proboscis*, the Water, upon drinking, is convey'd to the Throat, in the Manner peculiar to the *Elephant*.

FIGURE II. exhibits a View of the Right Side of the Head.

- a.* The round Process of the *Os occipitis*, entering into the *Pelvis Atlantis*.
bb. The occipital Bone of a monstrous Size.
cc. The Lambdoidal Suture.
d. The *Os petrosum* with the *Meatus auditorius*.
e. The outer Zygomatic Process of the Temple-bone.
f. The *Sutura squamosa* of the Temple-bone.

- g.* The *Os Sincipitis*.
- h.* The outer Process of the *Os frontis*, forming the upper Part of the Orbit.
- i.* The Bottom of the Orbit.
- k.* The Hole of the optic and pathetic Nerves, pointed to by a prick'd Line.
- l.* The upper Process of the *Os malæ*, join'd with the outer Process of the *Os frontis*, constituting part of the Orbit.
- m.* The anterior Process of the same *Os malæ*, join'd with the *Os maxillare*.
- n.* The posterior lateral or zygomatic Process of the same *Os malæ*.
- o.* Another zygomatic Process of the same *Os malæ*, peculiar to this Skeleton.
- p.* A Hole near the foregoing Process. *Quære*, if to let a Nerve pass to the Teeth?
- qq.* The anterior Process of the *Os maxillare*, constituting the Sockets of the Fore-teeth.
- rr.* The inferior lateral Process of the *Os maxillare*, supporting the Socket of an upper Grinder.
- ss.* A Grinder fast in its Socket, one on each Side; which is no small Argument that this Skeleton belongs to an *Elephant*, and not to the chimerical *Behemoth* of the Rabbins; or the *Behæmaeth* supposed different from the *Elephant*: of which *Buxtorff*, the learned *Bochart*, and others, have treated.

FIGURE III. gives the back View of the same Head.

- a.* The great Hole of the Occipital Bone, for the Passage of the *Medulla oblongata* to the *Spine*.

bb. The

- bb.* The *Processus globosi* of the Occipital Bone covered with a Cartilage, entering into the *Pelvis Atlantis*.
- c.* The *Os sphenoides* (*cuneiforme*, or *basilare*).
- d.* A peculiar and very remarkable *Sinus* of the Occipital Bone, deeper than an *Ostrich's* Egg, serving, in all Appearance, for the Insertion of the Muscles of the Neck.
- ee.* The outer Surface of the Occipital Bone intire.
- ff.* The Surface of the same Occipital Bone broke through, exhibiting deep winding Cells running on every Side.
- g.* The *Os petrosum*, with the *Meatus auditorius*.
- h.* *Quere*, If this be the Place behind the Ears, where in *Elephants* are wont to be kill'd, and here damaged by the Knife?
- i.* The outer zygomatic Process of the Temple-bone.
- k.* The outer Process of the Frontal-bone, constituting the upper Part of the Orbit (of the Eye).
- l.* The Bottom of the Orbit, and the Hole that gives Passage to the optic and pathetic Nerves, mark'd by a small Line.
- m.* The upper Process of the *Os male* join'd with the Process of the *Os frontis*, and making up a Part of the Orbit.
- n.* The posterior lateral or zygomatic Process of the *Os male*.
- o.* Another zygomatic Process of the same *Os male*, peculiar to this Skeleton.
- p.* The lower lateral Process of the *Os maxillare*, supporting the Socket of an upper Grinder.
- q.* The tranverse Process of the Maxillary-bone, or the greater *Os palati*, which is very short in the Skeleton

ton of an *Elephant*; whose Tongue is scarce longer than a Man's Hand: Which leaves no room to doubt but this must be the Skeleton of an *Elephant*.

- rr. The upper Grinders, one on each Side, to which their Opposites answer in the lower Jaw: And as the *Elephant's* Grinders are commonly four in Number, this Circumstance is another Proof of our Opinion.
- s. The Passage from the Nostrils into the Proboscis, and ending in the *Fauces*, with the *Os vomer* very visible: though ill drawn by the Neglect of the Painter.
- tt. The anterior Process of the *Os maxillare*, constituting the Sockets of the Fore-teeth, which are to be express'd in *Figure VI*.

FIGURE IV.

A Grinder, which seems to be the Left one of the lower Jaw, seen on the Outside. It weighs viij lb. 3ix. 3ij. Apothecaries Weight, or 10 Pound *Russian*.

Its greatest Length 12 Inches.

Its perpendicular Height 5 Inches.

Its Thickness, or Breadth, 3 Inches.

'Tis made up of above 20 transverse *Lamellæ*, a Finger thick, perpendicularly erect, lying close to one another, and its Root composed of two Apophyses.

- aa. The plane Surface of the exerted Part of the Grinder, scarce making half the Length of the Tooth, contrary to what is observed in the Grinders of the upper Jaw.

bb. The

- bb.* The Ends of the transverse *Lamellæ*, terminating in the Surface of the exerted Part, and here of the Hardness of Stone.
- cc.* The anterior *Lamellæ* not extending to the exerted Part, and, perhaps, lying hid either in the Socket of the *Os maxillare*, or under the Gums.
- d.* The anterior *Apophysis* or Root of the Tooth, not quite intire.
- e.* The posterior *Apophysis* or Root, broken as the foregoing.
- f.* A deep *Sinus* between the two *Apophyses*.

FIGURE V.

The Tusk, by some improperly called the Horn, of the Right Side, having a twofold Direction by being bent outward and backward, which is peculiar to the Male *Elephant*, it being straiter in the Female. It is the *Ebur fossile* of the Shops, and weighs cxxxvii lb. 3j. 3ij. Apothecaries Weight, or 160 Pound *Russian*.

Its Length, or the exterior Circumference of its back Part, was 136 Inches, 5 Lines.

The Circumference of the Root, where it got clear of the Socket, was the greatest, being 18 Inches, 5 Lines.

The subtended Arch from one Extremity to the other, 55 Inches.

The same subtended Arch *ac.* but bigger, 61 Inches.

a. The Root hollow within, the Cavity extending beyond the Place mark'd *b.*

b. The Root rising above its Socket, where it was thickest.

c. The

- c. The Place where the subtended Arch was greatest, 61 Inches.
- d. The Point of the Tusk somewhat bent outward and backward, although this Curvature could not be express'd by the Painter in a visible Manner in the lesser subtended Arch of 55 Inches.

The Tusk answering to the foregoing on the Left Side, was intirely like that on the Right, except the contrary Direction of its Curvature, and its less Weight, on Account of having lost its Point; for it weighed but cxxviii lb. 3viii. 3ij. Apothecaries Weight, or 150 Pound *Russian*: And this small Difference did not seem to deserve a separate Drawing.

FIGURE VI.

The Right Thigh-bone, exhibited to View on its Inner Side, which turns towards the Body. It weighed xxj lb. 3vj. 3v. 3ij. Apothecaries Weight, or 25 lb *Russian*.

Its perpendicular Length is 38 Inches, 5 Lines.

The greatest Breadth of its upper Head (or *Apo-physis*) 11 Inches.

Its Circumference at the Middle of the Bone, about 13 Inches.

- a. The Head cover'd with a Cartilage, placed on its Neck, and inserted in the Socket of the *Os Ischium*, and fasten'd by means of two Ligaments.
- b. The *Cervix* or Neck of the Bone.
- c. The upper external or greater *Trochanter*.
- d. The lower internal or lesser *Trochanter*.
- e. The Place in the Middle of the Bone, where the Circumference measured 13 Inches.
- f. The Sinus facilitating the free Motion of the *Patella*.
- g. The

- g. The other Procefs or inward Head, cover'd with a Cartilage, together with its Fellow.
 h. Two vertical *Sinufes* in the *Tibia* anfwering to the external *Trochanter*.

The Bones of this Skeleton, with the Ribs, *Vertebra*, and others thereto belonging, were found in the fandy Side of a fteep Hill, on the Eastern Bank of the River *Indigirska*, which falls into the Northern Ocean, not far from the Mouth of the Rivulet *Wolokowoi ruſzei*. The River *Indigirska* to the Eaſt of the River *Jena*, where it runs in its own Channel, has not been laid down by Mr. *Witſen* in his Map of the North-Eaſt Part of *Aſia*: But its Courſe is deſcribed by *Isbrand Ides* in the Map of his Travels. And ſome of theſe Bones are found now and then not only in theſe Parts, (which are ſo dangerous on Account of the exceſſive Cold, and continued Chains of inacceſſible Mountains, that to us *Europeans*, who have the Happineſs to live in a milder Climate, it would be preſent Death to travel through them) but likewise in the Sand-hills on the Rivers *Chatanga*, *Thomas*, *Tobol*, *Irtiſch*, &c. which are all at a good Diſtance from the Sea; though neither *Elephants*, nor chimerical *Behemoths*, have been ever ſeen in thoſe Countries, nor could they live therein by reaſon of the Inclemency of the Air. Wherefore the beſt Judges follow the Opinion of the learned Dr. *Woodward*, the *Scheuchzers*, and others, (whoſe Arguments, which are well known and of great Weight among the *Literati*, I think needleſs here to repeat) in taking them for the Bones of Antediluvian Animals, or of ſuch as were convey'd thither in the univerſal

Deluge. And lest the Truth of what I have said above be called in Question by such Persons as are prone to Envy, Calumny and Falshood, and detract the contrary Virtues in others; I thought proper to give a Copy of the original Certificate of a Person who was an Eye-witness to the digging it up.

WHereas Mr. *Messerschmidt* intreated me to let him know where the Head of the *Mammoth* with its Teeth and other Parts were found; as I was an Eye-witness to the digging it up, I thought proper to give him this short Account thereof in Writing: That Head was found by a certain *Russian* Soldier *Wafile Erlow*, on the Eastern Bank of the River *Indigirska*, not far from the Mouth of the Rivulet *Wolockowoi-ruszei*. After it was discover'd, I, being at Leisure, was present, and an Eye-witness to the digging up of this Skeleton or Bones. And further likewise, on the other Bank of the same River, which Bank is named *Sztanoijabr*, I saw a Piece of Skin putrified, appearing out of the Side of a Sand-hill, which was pretty large, very thick, and cover'd with long Hair, pretty thick set and brown, somewhat resembling *Goats* Hair: Which Skin I could not take for that of a *Goat*, but of the *Behemoth*; in as much as I could not appropriate it to any Animal that I knew. This I certify by this *Latin* Testimonial for the present, and can safely, and even hold it my Duty to give a more circumstantial verbal Account thereof, whenever her Imperial Majesty shall be graciously pleased to lay her Royal Commands on me. Sign'd,

Dated at Irkutskoe,
Feb. 10. 1724.

Michael Wolochowicz.

IX. Ex-

A Scale of 3 Feet

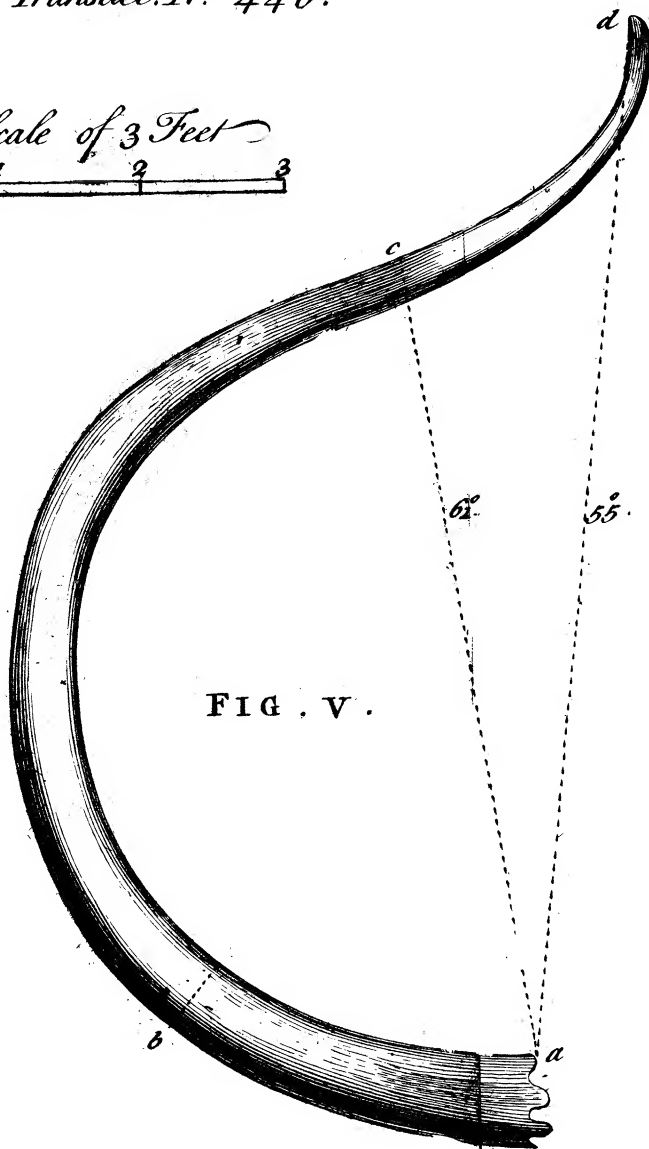
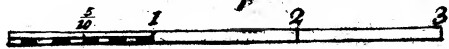
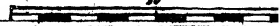


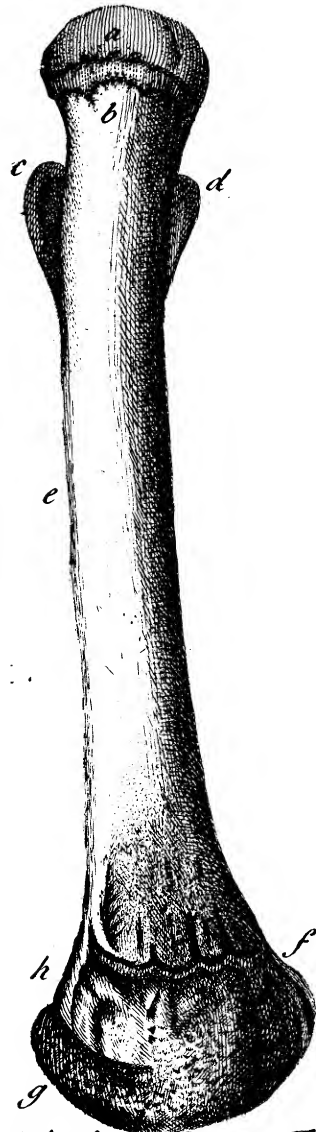
FIG. V.



FIG. VI.

A Scale





Scale of 2 Roman Feet

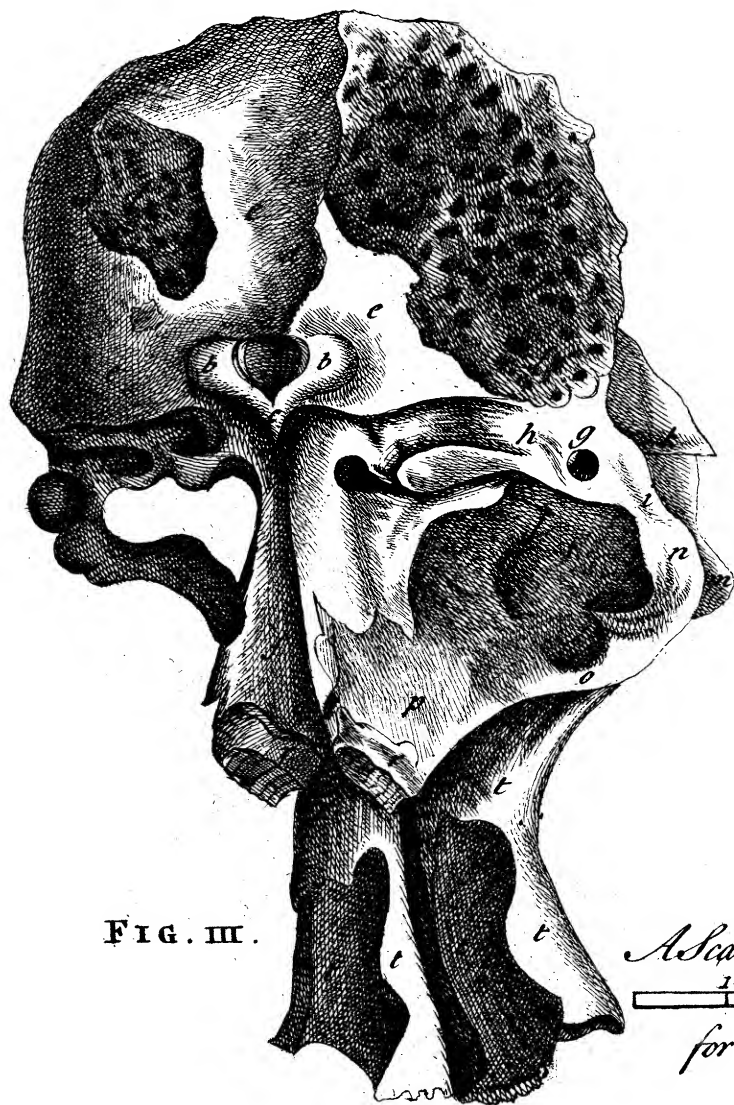
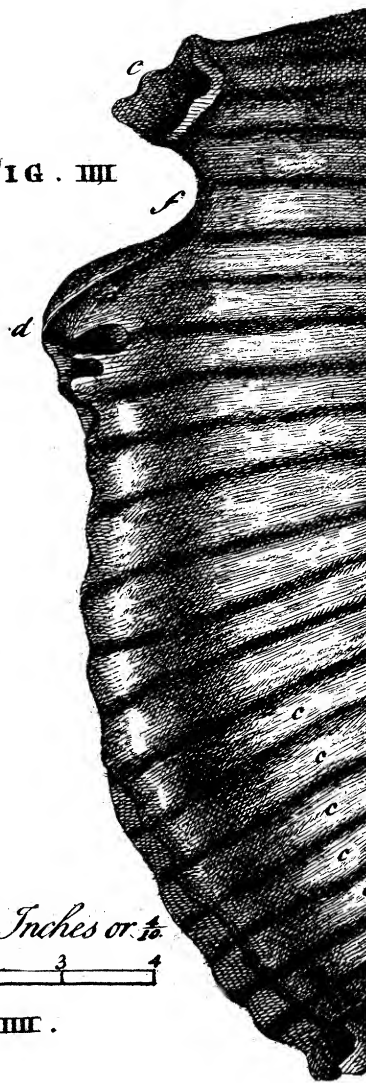
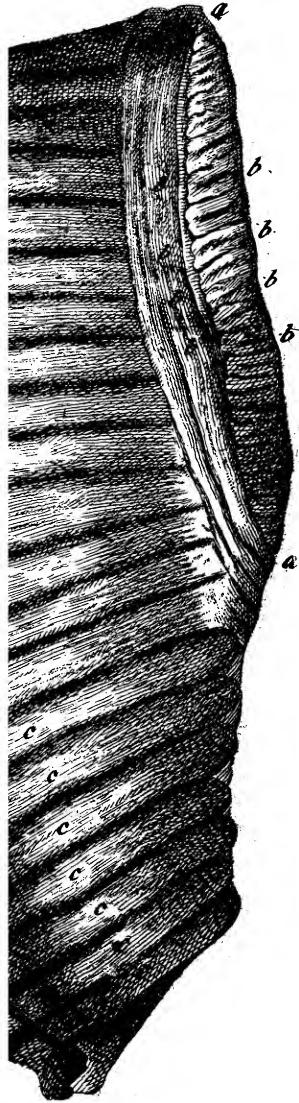


FIG. III.

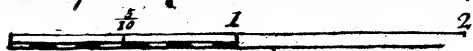
A Scale of 4 Inches or $\frac{1}{10}$
1 2 3 4
for FIG. III.

FIG. III





A Scale of 2 ancient Roman Feet



for FIG. I. II. III.

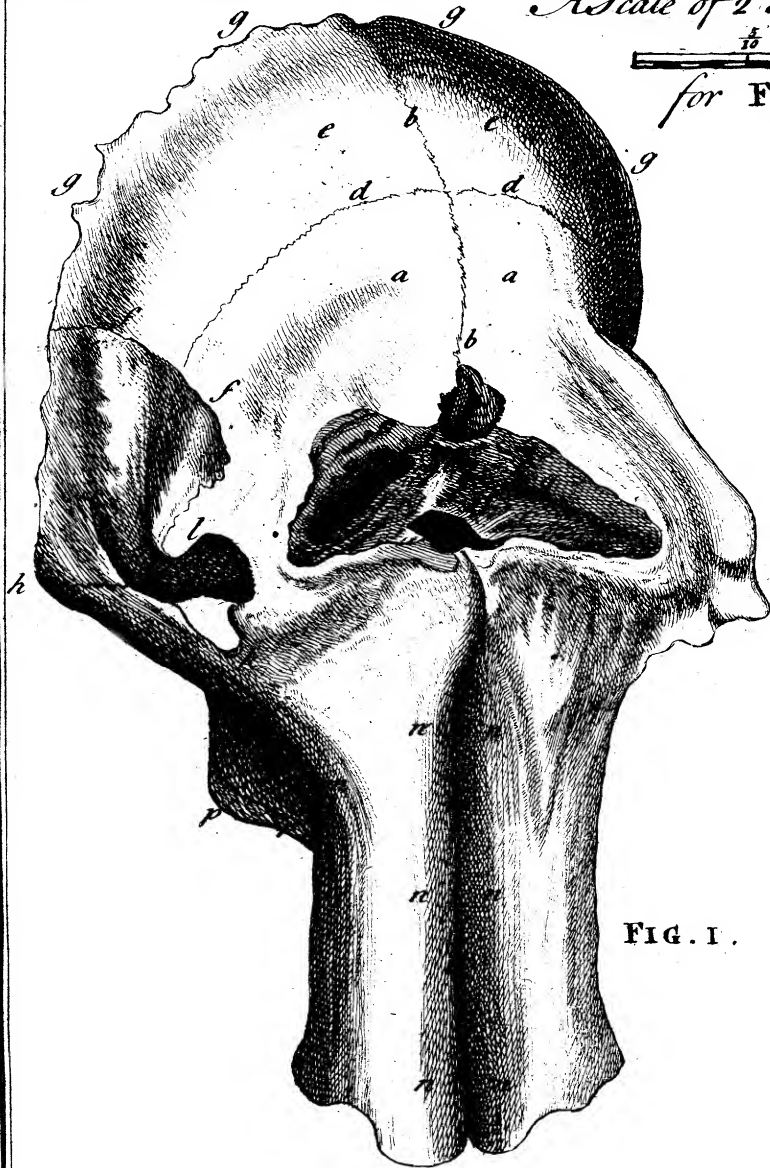
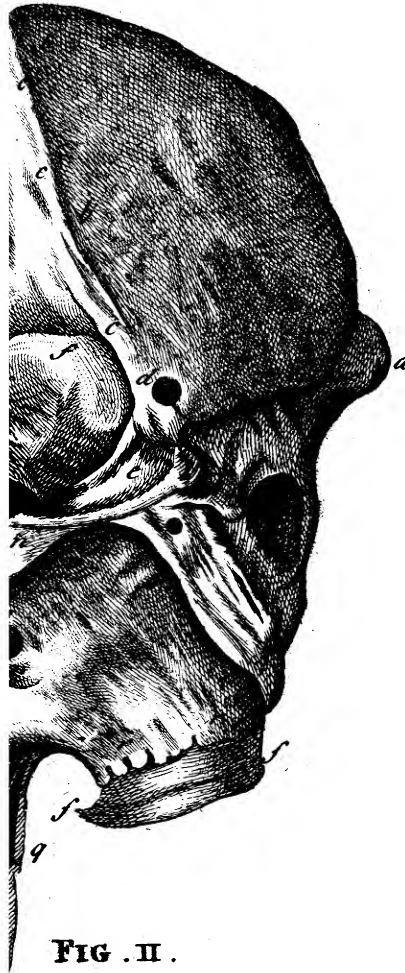


FIG. I.



FIG



Phalange Bone of N° 226.

Radius of 1/2 inch.



FIG. VI



Radius of 1/2 inch.



FIG. 10

FIG. 11



Anterior of a *Section*
of a *Section*
for *FIG. 11*



FIG. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.



FIG. 1.



FIG. 2.